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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/518,885	12/20/2004	Daniele Bigiavi	FE 6027 (US)	3555

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EXAMINER	
CHOI, LING SIU	
ART UNIT	**PAPER NUMBER**
1713	

DATE MAILED: 09/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/518,885	BIGIAVI ET AL.	
	Examiner	Art Unit	
	Ling-Siu Choi	1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 December 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 December 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/11/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-24 are now pending, wherein claim 1 is an independent one and all claims are drawn to a liquid phase process for polymerizing α-olefin.

Claim Rejections - 35 USC § 102

2. **The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:**

> **A person shall be entitled to a patent unless --**
>
> **(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.**

3. Claims 1-4, 7-11, and 13-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Hwang et al. (US 4,634,744).

A **liquid phase process** for polymerizing α-olefin to form a polymer that is soluble in a liquid reaction medium, the process comprising	
A	continuously polymerizing the α-olefin in liquid phase in the presence of a catalyst system based on a transition metal compound
B	continuously withdrawing from step A a solution of the polymer in the liquid reaction medium
C	mixing in one or more mixing stages the solution of the polymer in the reaction

	medium with an **organic deactivator** having (a) at least a hydroxy group, (b) a boiling point higher than 150°C, and (c) a ratio of the molecular weight (MW) to the number of hydroxy groups (n_{OH}) between 20 and 100

(summary of claim 1)

Hwang et al. disclose a method for continuously homopolymerizing ethylene or interpolymerizing ethylene with one or more 1-olefin in a reactor in the presence of a catalyst which comprises a transition metal derivative, wherein the polymer so formed is discharged from the reactor in a molten solution stream and wherein a deactivator comprising ethoxylated hydrocarbylamines of the formula of $R'_{3-n}N[(OCH_2CH_2)_mOH]_n$ is added to the molten polymer solution to deactivate the Ziegler-Natta catalyst (abstract; claim 1). Attention is drawn to Examples, wherein a copolymerization of ethylene and 1-butene is carried out (col. 6, lines 4-5). Thus, the present claims are anticipated by the disclosure of Hwang et al.

Claim Rejections - 35 USC § 103

4. **The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:**

> **(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.**

5. Claims 1-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Takayuki et al. (4,551,509) in view of Naga et al. (US 6,281,302).

Takayuki et al. disclose a process for producing ethylene polymer or ethylene copolymer, comprising the steps of (a) continuously polymerizing ethylene or ethylene and an α-olefin in a reaction mixture at a pressure of at least 300 kg/cm^2 and a temperature of at least 130°C in the presence of a catalyst composed of a compound of a transition metal of groups IVa and VIa of the Periodic Table and an organometallic compound of a metal of Groups I to III of the Periodic Table and (b) adding a polyalkylene glycol to the reaction mixture to deactivate the catalyst (claim 1).

The difference between the present claim and the disclosure of Takayuki et al. is the requirement of a liquid phase polymerization process instead of a gas phase polymerization process.

Naga et al. disclose a process for olefin polymerization in the presence of a catalyst comprising a transition metal compound of Group IV of the Periodic Table and an organometallic compound of metal of Grooup I, II or XIII of the Periodic Table (claim 1). Naga et al. further disclose that "slurry polymerization or solvent polymerization using an inert hydrocarbon solvent(e.g. propane, pentane, hexane, heptane, octane), liquid phase polymerization using no solvent(bulk polymerization) or gas phase polymerization can also be applied" (col. 9, lines 22-28). Thus, in view of the method to utilize the catalyst, gas phase polymerization is equivalence to and exchangeable with liquid phase polymerization. It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize liquid phase polymerization in the disclosure of Takayuki et al. and thereby obtain the present invention.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ling-Siu Choi whose telephone number is 571-272-1098.

If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reach on 571-272-1114.

LING-SUI CHOI
PRIMARY EXAMINER

September 13, 2005